

NOTES ON A COLLECTION OF FISHES FROM THE ISLAND
OF SHIKOKU IN JAPAN, WITH A DESCRIPTION OF A
NEW SPECIES, GNATHYPOPS IYONIS.

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The museum of Stanford University has received a small collection of fishes, made by Mr. Yoshiro Manabe, teacher of biology in the Kwansei Gakuin (College) at Kobe. The specimens were obtained from Yawatahama, a village on the coast of the Province of Iyo, which occupies the northwestern part of the large island of Shikoku. The collection has been sent to the United States National Museum.

Family EQUULIDÆ.

LEIOGNATHUS RIVULATUS (Temminck and Schlegel).

One young specimen.

Family OPISTOGNATHIDÆ.

GNATHYPOPS IYONIS Jordan and Thompson, new species.

Description of the type No. 74763, United States National Museum, a female specimen 74 mm. in total length, from Yawatahama, Iyo, Japan, collected by Yoshiro Manabe, a former student of Stanford University.

Head $3\frac{2}{5}$ in body length to base of caudal; depth $4\frac{1}{3}$; eye 4 in head; snout $5\frac{1}{2}$; interorbital space 13; maxillary $1\frac{1}{3}$; dorsal rays XI, 13; anal rays II, 14; scales in lateral series 47; gill-rakers 10 + 21; height of dorsal spine $4\frac{1}{2}$ in head; of longest dorsal ray $2\frac{1}{2}$; of pectoral 2; of ventrals $1\frac{2}{3}$; of caudal $1\frac{2}{3}$; depth of caudal peduncle $3\frac{1}{5}$.

Body compressed, with little slope in dorsal profile either anteriorly or posteriorly; maxillary extending to within a third of eye diameter from the preopercular angle, its tip not rounded, nor truncate, but broadest an eye diameter before tip, this condition caused by the large supplementary bone, the length of which is equal to the diameter of the eye and which does not extend to tip of maxillary proper; tip of latter very flexible; short snout, strongly curved downward from

between eyes; latter half length of post orbital part of head, looking upward and outward; interorbital space very narrow, concave. Tongue small, free, its tip rounded. Teeth all minute, the outer in jaws slightly enlarged; teeth present in pharynx; upper jaw with a pair of oval patches at symphysis, extended along anterior half as a single row; lower jaw similar; outer teeth very slightly enlarged. Vomer with a few small teeth. Roof of mouth with widely set, minute papillæ.

Scales absent on head, nape and above pectorals, and in gradually narrowing area to below first ray of soft dorsal, and thence in a narrow line along dorsal base to caudal; upper edge of caudal peduncle thus left naked; pectoral base, breast and caudal base also naked. Dorsal surface of head, suborbitals and snout thickly dotted with pores; especially large ones at upper angle of gill slit, on mandible and preopercular limbs; those of lateral line in double row anteriorly, frequently

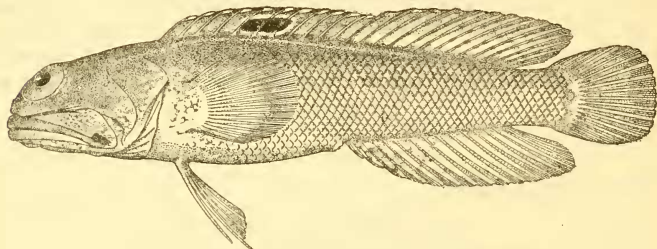


FIG. 1.—GNATHYPOPS IYONIS JORDAN AND THOMPSON; FROM THE TYPE.

single posteriorly. Lateral line extending along base of dorsal to eighth soft ray, discontinuous, however, on one side.

Dorsal fin continuous, last dorsal spine but slightly lower than first ray; spines subequal throughout; soft rays longest posteriorly. Anal similar to soft dorsal, inserted opposite its first ray. Caudal rounded, as is pectoral. Ventrals with two simple, somewhat elongate rays.

Color plain, olivaceous, save for a large oval black spot narrowly margined with white between fifth and eighth dorsal spines, and a deep black spot on inner side of maxillary tip on membrane connecting it with mandible. Spinous dorsal narrowly edged on rays with white, on membranes with dark. Scales with darkened margins, save on belly. Dorsal surface of head dusky. Pectorals, ventrals, caudal, and anal colorless.

This species is readily known from the other Japanese species, *Gnathypops hopkinsi* and *G. evermanni* by the naked area above the pectorals, by the much smaller outer teeth, by the peculiar coloration and the measurements.

The flexible, projected tip of the maxillary places it in the extreme of the genus, approaching *Opisthognathus*. From other species of the genus, it is distinguished by the minute teeth, the outer scarcely enlarged, not canine. Other characters are the very porous skin of the head and the naked breast and shoulders. These characters separate it from the fifteen other species of the genus *Gnathypops* in Asiatic, Australian, and East Indian waters as far as can be judged by descriptions and figures. All the American species have the teeth more enlarged.

Family CHAMPSODONTIDÆ.

CHAMPSODON VORAX Günther.

A specimen 94 mm. long differs from the plate given by Günther in the "Shore Fishes" of the *Challenger* Expedition, in having the anterior rays of the second dorsal elevated, the second ray being half the length of the head instead of a third. Other specimens in the Stanford University Collection from Wakanoura show intergradations, however, and we do not venture to separate the common Japanese species from the East Indian *Champsodon vorax*.

Family SCORPÆNIDÆ.

PTEROIS LUNULATA Temminck and Schlegel.

One small specimen, typical.

Family HOPLICHTHYIDÆ.

HOPLICHTHYS LANGSDORFII Cuvier and Valenciennes.

A specimen showing the typical two-spined body scutes as in the plate given by Cuvier and Valenciennes, beside numerous other char-

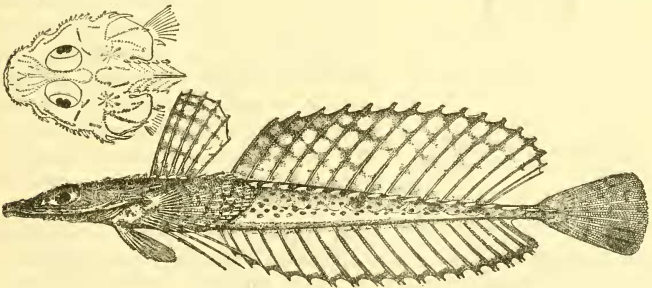


FIG. 2.—HOPLICHTHYS REGANI JORDAN.

acters separating it from the other Japanese species of *Hoplichthys*, *H. gilberti*, and *H. regani*.

It agrees entirely with specimens from Misaki, of which a description follows:

Head $3\frac{1}{2}$ in body length to base of caudal; breadth of head (including spines) $3\frac{1}{2}$; eye $4\frac{1}{2}$ in head; snout 3; maxillary $3\frac{1}{4}$; D. VI 15; A. 17; pectoral 15; lateral scutes, 27.

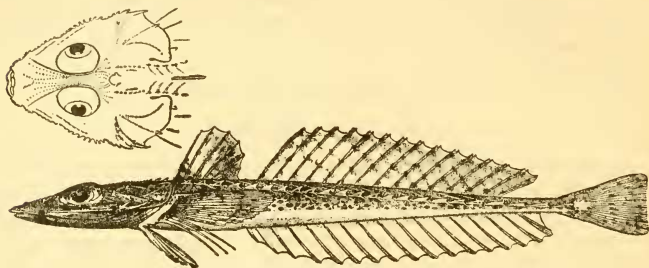


FIG. 3.—HOPLICHTHYS GILBERTI.

Head armature well developed, all ridges serrated, spines long and prominent; facial margins strongly serrated, each side with four marginal divisions less prominent than in *H. regani*, separated by slightly invaginated short smooth areas, each division with antrorse anterior spines and posteriorly directed posterior spines, the last spine longest and strongest, save those on tip of snout; the sharp thin edge nowhere completely interrupted, its height in posterior division $4\frac{1}{2}$ in longitudinal diameter of eye; distance between eye and preorbital margin contained two in length of eye; two serrate ridges on upper edge of preorbital well developed, serrations somewhat less prominent than in *H. gilberti*; space between these and preorbital margin everywhere strongly concave, a continuous groove extending along both ridges; smooth area in front of orbit $\frac{2}{3}$ length of eye, and extending slightly more than half way to snout; preocular ridges therefore diverging less than in any other species now known; interorbital

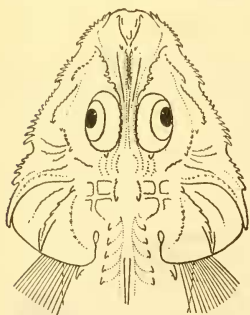


FIG. 4.—HOPLICHTHYS LANGSDORFFI.

space deeply concave, groove spreading posteriorly and continuous with concave space between "nuchal" spines; a "postocular" spine comparatively well developed, as are the "nuchal"; spines at angle of mouth well developed; preopercle with two spines, outer short, less than one-third length of larger; opercle with two spines, smaller than inner preopercular one, and with but three main ridges. Dorsio-

lateral scutes broader than length of eye, ventral lobe being half of same; two well-developed spines on each scute, the upper larger. Spinous dorsal low, longest spine equal to length of eye, not reaching insertion of second dorsal when supine; soft dorsal highest anteriorly, third ray $2\frac{1}{2}$ in head; soft dorsal inserted $\frac{3}{4}$ diameter of eye posterior to anal; latter's rays longest in center, $1\frac{1}{2}$ times eye diameter; longest free pectoral ray shorter than tip of pectoral by length of snout; in largest specimen four free pectoral rays present, in smaller three; tips of pectorals reaching seventh anal ray.

Color of spinous dorsal dusky on distal half, margin colorless; pectorals somewhat spotted; indistinct traces of spots on body and orbital area, but color of body nearly completely faded.

In the paper of Jordan and Richardson¹ the existence of two well-defined species of *Hoplichthys* in Japan was made evident. One of these was wrongly identified as the original *Hoplichthys langsdorfi* of Cuvier and Valenciennes. The other was named *Hoplichthys gilberti*. (Fig. 3.)

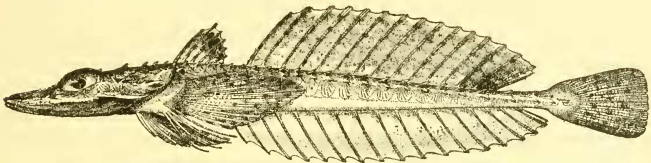


FIG. 5.—*HOPLICHTHYS LANGSDORFII* TEMMINCK AND SCHLEGEL.

In a personal letter of the same year, Mr. Regan informed Doctor Jordan of the existence of a third species, not known to Jordan and Richardson, and that this third species is the original *Hoplichthys langsdorfi*. This opinion seems to be correct, and in this paper we describe and figure the true *H. langsdorfi*. (Figs. 4 and 5.) In the *American Naturalist* for December, 1908, Doctor Jordan renames the species described and figured by Jordan and Richardson under the erroneous name of *Hoplichthys langsdorfi*, calling it *Hoplichthys regani* Jordan. (Fig. 2.)

The following analysis will facilitate the discrimination of the species.

Key to Japanese species of Hoplichthys.

- a*¹. Under side of head with a tuft of strong spines at the outer posterior angle of each mandible; lateral facial edges strongly lobed and with strong curved spines; lower spine of lateral scutes very obscure. Anal rays 16.....*regani*.
- a*². Under side of head without spines; lateral facial edges scarcely lobed; rather weakly serrated, except posteriorly; anal rays 17 or 18.
- b*¹. Lateral scutes each with two well-developed spines.....*langsdorfi*.
- b*². Lateral scutes, each with the lower spine very minute or hidden.....*gilberti*.

Family PLATYCEPHALIDÆ.

ONIGOCIA Jordan and Thompson, new genus.

Onigocia JORDAN and THOMPSON, new genus of Platycephalidæ; type, *Platycephalus macrolepis* Bleeker.

ONIGOCIA MACROLEPIS (Bleeker).

Two young examples.

The genus *Thysanophrys* Ogilby, as left by Jordan and Richardson,¹ should apparently be further subdivided. The present species is the type of a distinct group, characterized by the presence of large scales (about 40 in lateral line), three preopercular species and a small cirrus over the eye. This genus may be called *Onigocia* from the Japanese name *Onigochi* (devil flat-head) applied to *Onigocia spinosa*, the second Japanese species of the same genus.

Of the other generic types heretofore included under *Thysanophrys*, *Insidiator* Jordan and Snyder (*meerdervoorti*=*rudis*) differs in the small scales and in the absence of cirri over the eye. *Thysanophrys* proper of Australia and the East Indies (*longiceps*, etc.) has small scales (about 75 to 90), a well-marked cirrus over the eye, an unarmed lateral line, and but two preopercular spines. *Grammoplites* Fowler (*scaber* and other East Indian species) has the lateral line armed throughout with spines. The remaining Japanese species (*japonicus*, *crocodilus*) differ from *Grammoplites* in having the lateral line unarmed. These may constitute the new genus, *Inegocia* Jordan and Thompson, of which the type is *Platycephalus japonicus* Krusenstern.

Inegochi means Rice-kochi or flat-head. Kochi is the general name in Japanese for all Platycephalidæ and Callionymidæ.

Family GOBIIDÆ.

PTEROGOBIUS ELAPOIDES (Günther).

A single example of this species, partly intermediate in characters between *Pterogobius elapoides* Günther and *P. daimio* Jordan and Snyder. The body bands are rather those of *P. daimio*, the width of the black of the third body band being contained but two times and a half in the space intervening between it and the next. At the base of the caudal on one side is a band nearly as long as the caudal peduncle is deep, while on the other it is merely an oblong spot half that length. In this regard as in all other characters except the breadth of the lateral band this specimen is typical of *P. elapoides*. It is a female with large, ripe ova, and short dorsal fin.

The question as to the relations of the forms called *daimio* and *elapoides* is still unsettled. Jordan and Snyder regarded the two as different, the form called *daimio* being the southern representative

¹ Proc. U. S. Nat. Mus., vol. 33, 1908, p. 631.

of the other. Their material seems to bear out this conclusion, for both sexes are represented in both forms. Mr. Regan and later Snyder have concluded that *daimio* is the male and *elapoides* the female. This seems, however, not to be the fact. Of 18 specimens before us, typical of *Pterogobius daimio*, 11 are females, and 7 are males. In these portions only of the gonads remain, corroborating the fin characters, given below, in each case. Microscopic examination was necessary to decide the sex. None of these have a bar across the base of the caudal, as is typical of *P. elapoides* Günther. The male has a much more elongated spinous dorsal than the female, and longer soft dorsal rays, as well as darker vertical and ventral fins. The anal is narrowly edged with white. The differences between the nominal species *P. daimio* and *P. elapoides* seem to be the presence in the latter of an additional bar across the caudal base, vertical body bands, broader in specimens of the same size. The last-named characters intergrade.

Since the original description of *Pterogobius daimio* by Jordan and Snyder, Regan¹ has expressed the opinion that the brightly colored *P. daimio* is the male of *P. elapoides*, the other alleged characters entirely intergrading. Snyder² admits that the two species represent each a distinct sex but fails to find that the characters intergrade, and says further that "in our collecting the sexes were not found together, and the male specimens (*daimio*) far outnumber the females (*elapoides*)." Among the cotypes of *P. daimio* Jordan and Snyder, 7 are females with unripe ovaries, 1 a male, while 1 eviscerated is apparently a female, judging by the height of the dorsal fin. It is evident, however, that the sexes are both present in each form, and that they are apparently not of like distribution, *P. elapoides* ranging farther north. At the same time some characters intergrade, as is evident in the specimen from Yawatahama, and for the present we may regard the question as to whether *Pterogobius daimio* is a distinct species as still unsettled. The probabilities are that it is the northern type or subspecies, although the two meet at Misaki.

The table of measurements show that the dorsals of *P. daimio* are much higher than in *P. elapoides*, the dorsals in the female being higher than those in the male in the latter form.

The head in both forms forms 0.27 to 0.29 of body length. The spinous dorsal in the male *daimio* is 0.37 and 0.42 in two examples; in the female of *daimio* 0.25, 0.26, 0.26, 0.28, 0.29 in five examples. In the male of *elapoides* it is 0.25, 0.25, 0.25 in three examples; in the female 0.18, 0.21, 0.22 in three. The soft dorsal in the male *daimio* averages 0.18; in the female 12; in male *elapoides* 0.13; in the female 0.115. The fin rays and body measurements do not differ. The

¹ Annals and Magazine of Natural History, ser. 7, vol. 15, January, 1905, p. 22.

² Proc. U. S. Nat. Mus., vol. 42, 1912, p. 443.

scales average larger in *daimio*, 0.82, 0.84, 0.85, 0.87, 0.90, 0.90, 0.90, 0.92, while in *elapoides* we count 0.85, 0.85, 0.92, 0.94, 0.95, 0.95.

In Southern Japan, *P. elapoides* is rare, being recorded only from Misaki and Iyo.

DORYPTENA TANEGASHIMÆ (Snyder).

A specimen 90 mm. long, the color poorly preserved, showing but slight traces of the typical cross bands. The caudal fin is black; the pectorals very dark, with their pattern distinct, however; the dorsal spines slightly filiform and long ($1\frac{3}{4}$ in head), dorsal rays VI-14; anal rays 12. These are all very slight differences, and a direct comparison with the cotypes shows no specific distinctions.